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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

DUE DATE:		
FORMALITIES:	C.v	R.P.L
PAT. OFF:	A.K	
ON DB		
CASE NO.	PU0372-PCT	

Applicant's or agent's file reference PU0372-PCT	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/SE2004/001414	International filing date (day/month/year) 05-10-2004	Priority date (day/month/year) 06-10-2003
International Patent Classification (IPC) or national classification and IPC See Supplemental Box		
Applicant Amersham Biosciences AB et al		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>	
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>	

Date of submission of the demand 15-04-2005	Date of completion of this report 22-12-2005
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Form PCT/IPEA/409 (cover sheet) (April 2005)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/001414

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: **Cover sheet**

INTERNATIONAL PATENT CLASSIFICATION (IPC) :

C12N 5/00 (2006.01)

C07K 14/00 (2006.01)

C07C 29/00 (2006.01)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/001414

Box No. I Basis of the report

1. With regard to the language, this report is based on:



the international application in the language in which it was filed



a translation of the international application into _____,
which is the language of a translation furnished for the purposes of:



international search (Rules 12.3(a) and 23.1(b))



publication of the international application (Rule 12.4(a))



international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:



the international application as originally filed/furnished



the description:

pages _____

as originally filed/furnished

pages* _____

received by this Authority on _____

pages* _____

received by this Authority on _____



the claims:

pages _____

as originally filed/furnished

pages* _____

as amended (together with any statement) under Article 19

pages* _____

received by this Authority on _____

pages* _____

received by this Authority on _____



the drawings:

pages _____

as originally filed/furnished

pages* _____

received by this Authority on _____

pages* _____

received by this Authority on _____



a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:



the description, pages _____



the claims, Nos. _____



the drawings, sheets/figs _____



the sequence listing *(specify)*: _____



any table(s) related to the sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).



the description, pages _____



the claims, Nos. _____



the drawings, sheets/figs _____



the sequence listing *(specify)*: _____



any table(s) related to the sequence listing *(specify)*: _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-30</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>7, 8, 15</u>	YES
	Claims	<u>1-6, 9-14, 16-30</u>	NO
Industrial applicability (IA)	Claims	<u>1-30</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: US6378527 B1
D2: US6103479 A
D3: EP0420171 A1
D4: US2003133988 A1
D5: US5512474 A
D6: WO03072155 A1
D7: US6407208 B1

The invention relates to a microcarrier onto the surface of which a cationic compound has been immobilised via a guanidine group. The microcarrier is capable of attachment of cells, e.g. via charged-based interaction, and is used as a support in the culture of cells. The cationic compound may comprise one or two amino acids, such as arginine or a dipeptide. The invention also relates to a method of preparing a polycationic microcarrier, which method comprises immobilising a compound that comprises at least one guanidine group to an epoxide-activated substrate.

Document D1 is considered to represent the closest prior art. D1 describes methods for cell culture using polymers as microcarriers. The polymers should contain cationic groups to allow cell attachment, see column 12, line 43-column 13, line 21. To add cationic nature to the beads, different groups could be added to the polymer, for instance arginine, see column 16, line 67-column 17, line 7. Dextran, cellulose or another compound could be used as a microcarrier, see columns 15 and 16.

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

The invention according to claims 1, 2, 4-6, 10, 11, 19-23 and 25-30 differs from the method in D1 in that it explicitly describes that a cationic compound, for instance arginine, is immobilised to a microcarrier via a guanidine group. D1 does not describe how arginine is bound to the microcarrier.

It is not clear from the claimed invention why it is more advantageous to have a guanidine group than another group. It is also not clear from the claimed invention what type of microcarrier is used. Consequently, with the background of D1, the problem is to find a method to attach arginine to a microcarrier.

It is considered obvious to a person skilled in the art to use what is known from D1, where arginine is known to be used as a cationic compound in microcarriers, to create microcarriers described in the claimed invention according to claims 1, 2, 4-6, 10, 11, 19-23 and 25-30. It is considered obvious to a person skilled in the art to attach arginine via a guanidine group to a microcarrier when it is known that arginine could be attached to a microcarrier. Hence, the invention according to claims 1, 2, 4-6, 10, 11, 19-23 and 25-30 is not considered to involve an inventive step.

According to the arguments stated above, the subject matter defined in claims 3 and 9 is considered to relate to measures obvious to a person skilled in the art. Therefore, claims 3 and 9 are not considered to involve an inventive step.

It is known to use cells in high throughput screening (HTS), see D2 abstract. D1 and D2 are considered to relate to the same technical field. Therefore, it is considered obvious to a person skilled in the art to combine D1 and D2 to achieve the claimed invention according to claim 24. Hence, claim 24 is not considered to involve an inventive step.

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

Claims 12-14, 17, 18 differ from D1 in that the surface of the substrate is epoxide-activated. D3 describes a method for culturing cells on surfaces. On page 4, lines 25-30, D3 describes that cellulose is epoxide activated when fibrous protein is bonded to cellulose. It is considered obvious to a person skilled in the art to combine D1 and D3 to achieve the invention according to claims 12-14, 17, 18. Therefore, claims 12-14, 17, 18 are not considered to involve an inventive step.

To use nucleotides coupled to microcarriers is known, see D4 page 1, part 2, page 4, part 29. It is considered obvious to a person skilled in the art to combine what is known from D1, D3 and D4 to achieve the invention according to claim 16. Hence, the claimed invention according to claim 16 is not considered to involve an inventive step.

Documents D5-D7 merely describe the state of the art and are not commented on further.

The invention defined in claims 7, 8, 15 is not disclosed by any of the cited documents D1-D7.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed microcarrier with a dipeptide immobilised on a surface. Therefore, the claimed invention according to claims 7, 8, 15 is not obvious to a person skilled in the art.

Accordingly, the invention defined in claims 1-30 is novel and claims 7, 8, 15 are considered to involve an inventive step. However, claims 1-6, 9-14, 16-30 are not considered to involve an inventive step. The invention is industrially applicable.